The chip carrier according to the first embodiment that is configured as described above is composed of only a small number of parts and has a simple mechanism. The chip carrier can be assembled by sequentially stacking the chip 5, the inner lid 8, and the outer lid 7 on the carrier base 1 in the same direction and finally rotating the outer lid 7 so that it is engaged with the carrier base 1. As such, the assembling consists of only a small number of steps each of which is simple; the assembling can be automated easily.

In particular, since the outer lid 7 is in contact with the inner lid 8 without being in direct contact with the chip 5, the surface of the chip 5 is not rubbed and damaged when the outer lid 7 is rotated. Since the inner lid 8 is accommodated in the opening 4a so as to be fitted in the frame defined by the wall surfaces of the opening 4a, the rotation of the inner lid 8 is prevented with the wall surfaces of the opening 4a serving as stoppers, that is, the inner lid 8 does not rotate in link with the rotation of the outer lid 7. Therefore, there does not occur a phenomenon that deviation in the mounting position of the chip 5 causes a contact defect or the like of the contact film 3.

In the chip carrier 1 according to the first embodiment, it is sufficient to secure spaces for the body portion around the opening 4a and the erect portions 4b in addition to a space for the chip 5. This enables formation of a compact chip carrier 1. Further, since the constituent parts do not include parts that should be particularly durable, all the constituent parts can be made of a light resin. That is, the shape and the material of the chip carrier 1 can be made approximately the same as those of packaged semiconductor devices. Therefore, testing equipment for semiconductor devices can also be used for the

chip carrier, whereby the equipment cost can be reduced and the test efficiency can be increased.

The chip carrier according to the first embodiment is particularly suitable for the TSOP, SOJ, BGA, and the like.

In the first embodiment, the outer lid 7 and the carrier base 1 are formed with the recesses 7b and the projections 4c, respectively, and the projections 4c are fitted into the recesses 7b. However, an opposite structure is possible in which the outer lid 7 and the carrier base 1 are formed with projections and recesses, respectively, and the projections are fitted into the recesses. This structure can provide the same advantages as in the first embodiment.

In the first embodiment, the side surfaces 7a of the outer lid 7 and the inner surfaces 4d of the carrier base 1 have arc shapes and the outer lid 7 is engaged with the carrier base 1 by sliding the outer lid 7 along the arc shapes. Another structure is possible in which the side surfaces 7a of the outer lid 7 and the inner surfaces 4d of the carrier base 1 do not have arc shapes but the outer lid 7 can still be engaged with the carrier base 1.

Second Embodiment

A second embodiment of the invention will be hereinafter described in detail with reference to the drawings. A chip carrier according to the second embodiment is different in configuration from the chip carrier according to the first embodiment in that the outer lid has a projection.

Fig. 4 is a schematic sectional view of a chip carrier according to the second embodiment. Fig. 4 corresponds to a sectional view of the assembled chip carrier of Fig. 2 taken along line A-A in Fig. 2. Figs. 5a and 5b are a schematic top view and bottom view of the outer lid 7 of the chip carrier shown in Fig. 4.

More specifically, as in the case of the first embodiment, the pair of arc-shaped side surfaces 7a of the outer lid 7 are formed with the respective recesses 7b. As shown in Fig. 5a, the recesses 7b can be seen from above the outer lid 7. The arc shapes of the side surfaces 7a have a constant radius of curvature about the rotation axis about which the outer lid 7 is rotated when engaged with the carrier base 1.

As shown in Fig. 5b, the bottom surface (i.e., the surface to be opposed to the inner lid 8) of the outer lid 7 is formed with a projection 7c. The projection 7c is conical or semispherical, for example, and is formed on the rotation axis of the outer lid 7.

In the chip carrier having the outer lid 7 that is configured as described above, as shown in Fig. 4, the chip 5 is mounted on the contact film 3 of the carrier base 1. The inner lid 8 is mounted on the chip 5. The outer lid 7 having the projection 7c is mounted on the inner lid 8. The outer lid 7 causes, via the inner lid 8, the chip 5 to be pressed against the contact film 3 with proper force.

As in the case of the first embodiment, the outer lid 7 is rotated in the space formed between the erect portions 4b and is thereby engaged with the carrier base 1. Since the projection 7c is formed on the rotation axis, only the projection 7c is in point contact with the inner lid 8 and the other portion of the outer lid 7 is not in contact with the inner lid 8. Therefore, the rotation of the outer lid 7 is completed while causing almost no friction between the outer lid 7 and the inner lid 8. As a result, even if some play exists between the inner lid 8 and the opening 4a, the inner lid 8 don't move in link with the rotation of the outer lid 7.

As described above, the second embodiment can provide a chip carrier that has, in addition to the advantages of the